Universal Design as a Key Feature of the Sustainable Development

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Abstract

As sustainable development is a process that looks towards the future and the next generations, building for the days to come is, obviously, an important part of it. Thus, universal design with its user centered approach is an appropriate way of shaping the built environment to answer both the contemporary need for diversity and the future changes related to demographic trends. The paper starts from the definition of sustainable development focusing on its goal on meeting human needs and aspiration and is looking at universal design as the proper approach for building an inclusive environment usable by all. The review of the definitions of universal design is followed by a brief presentation of the origins and evolution of the idea and an introduction of similar concepts like Design for All and Inclusive Design. The research then focuses on the beneficiaries of universal design to demonstrate its concern towards a wide range of users and ends with an insight into some demographic trends to be included in designing tomorrow's built environments.

Rezumat

Dezvoltarea sustenabilă este un proces ce priveşte în viitor şi către generaţiile următoare. De aceea, a construi pentru mâine este, evident, o parte importantă a acestui proces. Astfel, designul universal cu a sa abordare centrată pe utilizator este un mod adecvat de a modela mediul spre a răspunde atât nevoii de diversitate a lumii contemporane cât şi schimbărilor viitoare legate de tendinţele demografice. Lucrarea porneşte de la definiţia dezvoltării sustenabile concentrându-se asupra scopului său de a răspunde nevoilor şi aspiraţiilor oamenilor şi vede designul universal ca o abordare potrivită în construirea unui mediu incluziv posibil de folosit de către toată lumea. Trecerea în revistă a definiţiilor designului universal este urmată de o scurtă prezentare a originii şi evoluţiei ideii şi de prezentarea conceptelor similare, precum Design for All si Design-ul Incluziv. Cercetarea se concentrează apoi asupra beneficiarilor designului universal pentru a arăta preocuparea acestuia pentru o gamă largă de utilizatori şi se încheie cu o privire asupra unor tendinţe din demografie ce pot fi incluse în proiectarea mediilor construite de mâine.

Keywords: universal design, inclusion, enabling, barrier free environment, user centered design

1. Some Thoughts on Sustainability and Diversity

The common view on sustainability is mostly related to energy and resource saving, reducing CO_2 emissions, using materials and technologies with low impact on the environment, reduce waste. But if we follow these goals and try to think on how to achieve them, other lines of thought are opening to us, showing that the issue of sustainability is much more complex. Building today for the days to come can also be a good strategy in respect for designing a sustainable environment.

The accelerated pace of contemporary society often leads to dramatic changes in the economic system and also in lifestyles, with the result that a lot of buildings, be them production facilities, dwellings or public spaces become obsolete and are abandoned only a short time after they are built. The question is how can we foresee the future transformations in order to be able to answer their challenge through design? One way of doing this should be to design for the future needs of the users, as they can be grasped from the demographic trends. Designing for the actual and future needs and aspirations of people is an important part of sustainability, as the UN Report of the World Commision on Environment and Development "Our Common Future" (also known as the Report of the Brundtland Commision, 1987) states: "In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations." [1]

Over the last several decades, architects and designers have thought about the anonymous user through an abstract model like the man from Neufert's "Architects' Data" [2, p.15]. Even today, students from architecture and design schools are taught the same. But the population is diverse and a lot of people just do not fit the perfect dimensions of the Neufert's man. Maybe it is this model that does not fit in the nowadays society and every design produced in respect to it is, or will be in a short while, obsolete. So, how do the users look nowadays? Are they like Le Corbusier's modulor, 1,83 meters tall and in perfect health condition? If not, how this diverse population looks like?

Some people use wheel chairs to walk; they can't pass over obstacles bigger than half a centimeter or one and a half when tapered or climb a ramp stepper than 8 percent. Others use a walking cane or a crutch; they need larger spaces and firm pavements, and no obstacles where the cane can stick.

Some people are visual impaired; in order to be able to manage in urban environment they need tactile tiles in the pavement, audible signs and inscriptions in Braille.

Some people are small; others are large; public spaces should be designed according to their size as well, and also to the height of their eye level – think about the public relation desk.

Some people cannot hear very well; because they cannot notice warning sounds, they can be in danger in the urban environment.

The elderly are a population group with a higher rate of disability than the other age groups. They benefit from an accessible and friendly environment and can have an independent and active life in such an environment.

People carrying babies in pushchairs can become disabled in an inaccessible environment: you cannot carry a baby in a pushchair on a stair; you can't just ooze with it in a crowded bus.

For people carrying a large parcel or luggage the obstacles can be dangerous and the stairs or narrow corridors can become barriers impossible to overcome.

There are also people with undeclared disabilities: persons with cardiac problems have severe difficulties when climbing a stair or can suffer if they stay too long in the sun.

Noticing how diverse the population is, and especially how diverse the users' needs are, a question arises: how to design buildings and products to meet, as much as possible, "human needs and aspirations", "both current and future potential"? For the last few decades, some trends related to

human centered design converged in a concept focused on design for human diversity and determined to create an inclusive environment for all. This concept is known as Universal Design.

2. Definitions of Universal Design

Ronald Mace, architect and advocate for accessible and universal design, was the first who coined the term. He defined the concept in 1985 in his book *Universal Design, Barrier Free Environments for Everyone*: "The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." [3].

Although the spirit of this definition is clear, it generates some comments. On one hand, by saying "without the need for specialized design" it seems to exclude the assistive devices for people with disability and not to consider accessibility. On the other hand, an environment or product usable by all people sounds like a Utopia, knowing the fact that there will always be somebody not able to use a building or a commodity. [4, p.28] Also, the definition focuses only on physical environment – buildings and products – and says nothing about services or the virtual.

Mace's definition was used in the *UN Convention on the Rights of Persons with Disabilities* in 2006: ""Universal design" means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed." [5] The definition from the UN Convention adds programmes and services to the products and environments already mentioned by Roland Mace, and also specifies that the assistive devices are not excluded. But designing for human diversity involves more than that. It can also be about inclusion and participation.

In their book *Universal Design. Creating Inclusive Environments,* Edward Steinfeld and Jordana Maisel came with an improved definition which sees universal design more like a process than a fixed state and is focused on allowing and enabling, not only on setting rules: "Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation" [4, p.29]. The authors are explaining the improvements they did to the existing definitions and also their innovative approach: "universal design should recognize the context in which design takes place rather than imposing an absolute standard to every situation. The definition frames universal design as both an idealistic approach in the long term and a realistic approach in the short term. It specifically addresses the outcome of the process, including the often neglected outcomes of improved health and social participation. In addition it recognizes that inclusion must address the full diversity of the population." [4, pp.29-30] In order to better understand the terms used in the definition and, most of all, the concept of universal design, it is useful to have a quick look on its sources and on the evolution of this idea.

3. The Origins and the Evolution of the Concept

If we see design as "an active, purposeful adaptation method that people use to adjust the world to their needs" [4, p.1] we can easily understand that it was used by man to shape the environment in order to make it accessible for himself, or to build shelter and protection against the elements or some possible threats. In other words, design is a tool used in order to deal with the barriers, either to overcome them to the user benefit, or to build them for protection against something or somebody. It is not surprising then that the first buildings and settlements were more focused on protection, on making them inaccessible for the enemies.

Even when defensive buildings were not needed any longer, there was no concern for an accessible environment. The buildings were designed for those healthy and sound, and people who had a handicap were excluded by being neglected. Only with the development of social institutions disabled persons were protected in special environments. But this protection implied dependence and also the exclusion from society. The contemporary world is now making a big step towards social integration and acceptance and it is in a third stage of "independence through the development of a legal framework and physical environment that eliminates discrimination and removes barriers to independence" [4, p.21].

This trend towards an accessible environment started in USA with disability rights movement in the late 1960s, part of a larger wave for the civil rights. It was prepared by the awareness campaigns the advocacy groups had started in the late 1950s when founding that the universities were not accessible for the war veterans and for the young people with disabilities due to the polio epidemic after the war [4, p.36]. As a result of these movements, a series of laws and regulations have been adopted, starting with Architectural Barriers Act in 1968.

Seeing the results of the laws putting into force, some people started to understand that the environment could be more accessible than the one resulted only by implementing some regulations, and started to develop the concept of universal design. If accessibility addresses a broader range of users, the accessible environment would not be the exception any longer but become the norm. Through this new idea, not only that the possible flaws resulted from a mechanical use of accessibility regulations were avoided, but some major deficiencies of the accessibility concept were overcome. Universal design aims to reduce the need for special accommodation and the use of assistive devices, which are most of the time expensive and hard to find [4, p.28]. It also eliminates segregation between able and disabled people by providing an accessible environment good for all. And, by allowing more people to have an active life, it reduces the burden of social programme and services of assistance.

4. Similar Concepts

As the principles of barrier free design and later those of universal design spread, some similar concepts emerged in other parts of the world. The result is that today, we find basically the same approach under the names of Design for All (in Europe) and Inclusive Design (in the UK).

Design for all was presented in the EIDD Stockholm Declaration adopted in 2009 by the Annual General Meeting of the European Institute for Design and Disability. It asserts the European Union's values of diversity and equality: "Design for All is design for human diversity, social inclusion and equality." [6] The concept is focused on the capacity of design to enable: "Design for All aims to enable all people to have equal opportunities to participate in every aspect of society. To achieve this, the built environment, everyday objects, services, culture and information – in short, everything that is designed and made by people to be used by people – must be accessible, convenient for everyone in society to use and responsive to evolving human diversity." [6] As it can be seen, the definition does not elude the accessibility, and it points to a participative design approach: "The practice of Design for All makes conscious use of the analysis of human needs and aspirations and requires the involvement of end users at every stage in the design process." [6].

There is also the definition released by Design for All Foundation, and it emphasizes a user centered approach: "Design for All is design tailored to human diversity" [7] It is also related to sustainability for it aims to design an environment for the next generations: "Design for All is the intervention into environments, products and services which aims to ensure that anyone, including future generations, regardless of age, gender, capacities or cultural background, can participate in

social, economic, cultural and leisure activities with equal opportunities." [7]

But the most powerful statement is the one concerning the right of being independent: "Design for All/Universal Design should be implemented in all areas because the human beings are diverse and everyone has the wish, the need and the right of being independent and choosing the own life style without facing physical and social barriers." [7]

Inclusive Design is the name under which the concept is refered to in the United Kingdom. It is defined as: "The design of mainstream products and/or service that is accessible to, and usable by, as many people as reasonably possible… without the need for special adaptation or specialized design." [8] Though the definition is very similar to Ronald Mace's definition of universal design, inclusive design is more business focused because it answers human diversity in order to include more customers. "By meeting the needs of those who are excluded from product use, inclusive design improves product experience across a broad range of users. Put simply inclusive design is better design." [9] Understanding the user is seen mainly through a commercial point of view as it is asserted in the Ethos of inclusive design: "Failure to correctly understand the users can result in products that exclude people unnecessarily and leave many more frustrated, leading to downstream problems, such as increased customer support requirements that can ultimately reduce commercial success. Conversely, successful implementation of inclusive design can result in a product that is functional, usable, desirable, and ultimately profitable." [8]

5. Beneficiaries of Universal Design

For the barrier free movement and for accessibility disabled people were the main target population. Also, because of the high rate of disability on their age group, the elderly were also seen as beneficiaries of a barrier free environment. But, as a lot of products (like remote control or flexile drinking straw, to name only two) which were first designed for people with disabilities, the accessible environment proved to be good for all. This way, to the initial target group of disabled people, for whom accessibility is essential, some other groups joined. They are those for whom accessibility is necessary and I am referring to elderly, parents carrying babies in push-chairs, pregnant women, children, people very short, very tall, very light or very heavy or people with psychosocial conditions and many others.

Accessibility regulations notice many of those categories, but not all of them. The Romanian standard for the accessible built environment [10] mentions:

1. Handicaped persons – those persons who, due to physical, mental or sensory impairment, lack the abilities to carry on everyday activities
a. disability of the limbs – persons with movement difficulties, wheel-chair users, persons with difficulties on using the arms
b. visual deficiencies
c. hearing deficiencies
d. diminished physical and sensory capacities due to some disease

2. other persons
a. persons with temporary handicap (injured persons during medical rehabilitation and persons in a special state – pregnant women, persons carrying babies in push-chairs; young children, persons carrying large objects)
b. elderly people

As we can see, the target population for accessibility regulation is just a part of the beneficiaries of

the universal design. Designing an accessible built environment not only for those mentioned in the accessibility laws and standards but for all the users is one of the main goals of Universal Design. Shaping our environments in this inclusive approach is the answer to the demographic and societal changes of the future depicted in the nowdays trends and by statistics.

6. Important Demographic Trends

As we have seen, universal design is addressing a broader range of target population than accessibility. Its first principle being "equitable use", universal design aims to deliver one accessible environment or product for all and is not encouraging segregation between able and disabled users. Because it addresses to everybody, it cannot neglect the aesthetic features of the building or product and its approach towards its customers is a marketable one. Having a customer orientated view, those who practice universal design should be alert to every change regarding the needs of the users and even more, to anticipate them. Therefore, looking at the demographic data, and understanding the trends they present is an essential approach in this field.

Being aware of the future changes of the users needs and aspiration is a key for a sustainable design. And this is where universal design comes in with its knowledge and skills, which enables it to meet a broader range of coustomers' demands. Beside disability, universal design can also answer the demands coming from other population targets.

There are a few demographic trends that are already playing an important role. One of them is population aging, a demographic trend to be found especially in the North America and Europe. According to the *European Union 2012 Ageing Report. Economic and budgetary projections for the 27 EU Member States (2010-2060)*, the percent of people of 65 and older will raise from 17% to 30%, while the percent of those being 80 and older will become equal to the young population by 2060 [11]. As the rate of disability is higher at this age group, an environment conceived according to universal design concept will prove to be a key issue for the future users.

Another demographic trend is related to unhealthy lifestyles like sedentariness and unhealthy nutrition. The increase of obesity among adult population has the highest rates in USA. By improving the pedestrian spaces and making the cities more walkable designers can build an environment that encourage physical activity with a good impact on the health condition and wellness.

The world's population is getting heterogeneous. Minorities are growing in number and tend to modify the demographic profile of some regions. As a result, future generations will have different values and needs. This increasing diversity will also be a challenge for designers.

7. Conclusions

As the concept evolved from barrier-free design to Universal Design, the issue of an accessible built environment became wider. More people are becoming aware of the fact that an accessible environment, essential for people with dissabilities, is also necessary for the elderly, for the parents with small children or for people who are temporary injured. Finnaly, an accessible environment is comfortable for us all. From being a niche topic, accessible design is becoming a widespread approach for the benefit of all users.

Looking at the demographic trends it is conspicuous that the number of people who are beneficiaries of Universal Design will increase in the near future. The aging trend of the population,

especially in Europe and North America will require accessible buildings and cities in order to allow as much people as possible to have an active life in an inclusive environment. At the same time, pedestrian friendly neighbourhoods and spaces for leisure and sports will be of a great help in the future considering the actual trend for an unhealty lifesyle with an increasing tendency for obesity, due to sedentariness and unhealthy nutrition.

A sustainable design has to be done in respect for the future generations. This is not limited only to resource preservation or the quality of the natural environment, but it also aims at shaping the built environment to fulfill the needs and desires of people using it. Universal Design aims at building an environment, which can provide a better life to a wide number of people. By understanding the actual users and by paying attention to the demographic trends, designers can provide an answer to the needs and aspiration of the contemporary word as well as of the generations to come.

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